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10/617,042	07/11/2003	Yoshihiro Ishida	03560.003336.	3064

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EXAMINER
YUAN, KATHLEEN S

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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *31 August 2007*.

2a)☒ This action is **FINAL**.   2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-11* is/are pending in the application.

    4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-11* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a)☐ All   b)☐ Some * c)☐ None of:

      1.☐ Certified copies of the priority documents have been received.

      2.☐ Certified copies of the priority documents have been received in Application No. _____.

      3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1)☐ Notice of References Cited (PTO-892)

2)☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3)☐ Information Disclosure Statement(s) (PTO/SB/08)
    Paper No(s)/Mail Date _____.

4)☐ Interview Summary (PTO-413)
    Paper No(s)/Mail Date. _____.

5)☐ Notice of Informal Patent Application

6)☐ Other: _____.

DETAILED ACTION

The response received on 8/31/2007 has been placed in the file and was considered by the examiner. An action on the merit follows.

Response to Amendment

1.   The amendments filed on 31 August 2007 have been fully considered. Response to these amendments is provided below.

<u>Summary of Arguments and Examiner's Response:</u>

2.   *The applicant argues that Li does not teach the face-detection angle-range information determination means that determines angle ranges on the basis of image attached information*

3.   It is unclear as to what the applicant is arguing, or perhaps the applicant does not fully understand the previous rejection. The examiner will try to clarify the rejection here and address the arguments after. The rejection was based on Silverbrook in view of Li et al. Silverbrook taught image attached information that indicated the correct orientation of the image, i.e. whether the image is a horizontal or vertical. In order for Li to detect face angles, Li et al needs to know the correct orientation of the image being processed, since the orientation of processed images must be right side up, as seen in fig. 8 of Li et al, to extract certain windows that may contain a face. Therefore, Li et al uses the image attached information of the right orientation of the image in order to detect angle range of the face itself. The combination of Silverbrook and Li et al teaches the

face-detection angle-range information determination means that determines

angle ranges on the basis of image attached information.

4.   *The applicant continues to argue, "In the detector pyramid of Li et al., sub-*

windows--various croppings of a full-size image--are extracted from an input

image and then processed by a face detection system. As shown in Fig. 4, face

detection for each sub-window is hierarchical: detectors at each lower level have

a smaller angular range than the detectors of the preceding level (col 11., lines

35-44). For each sub-window, the system determines whether the sub-window is

a face and, if so, its pose range (col. 12, lines 4-6). The pose range is determined

solely on the basis of which detector detects the face, i.e., the pose range is

determined by the known angular range of the detector that records a detection

(col. 14, lines 33-40). Li et al. effectively teaches away from using image

attached information to determine an angle-range information. Thus, the detector

pyramid of Li et al. fails to teach or suggest a face-detection angle range

information determination means or step that determines pose range information

on the basis of image attached information."

5.   Some of the summary in the applicant's arguments of Li et al is correct;

however, some of the summary illustrates confusion in the reference. The

applicant is correct that sub-windows are input into the detector pyramid and that

the detection for each sub-window is hierarchical. The pose range is determined

on the basis of which detector detects the face (but not solely on this), thus

showing the pose range of the sub-window. The pose range is also determined

on the basis of the subwindows of a correctly oriented image itself. However, the

applicant gives an example that the pose range is determined by the known

angular range of the detector that records a detection and cites column 14,

indicating that the applicant thinks that somehow there are multiple physical

detectors/ cameras that take the image in and indicate the angle by which

camera takes the image. This example seems to be erroneous, since the

detectors do not record a detection, they simply detect/classify/categorize the

angular range by judging input image information in the subwindows. This is

further supported not only by fig. 6, but the cited column 14 where Li et al

explains that the detectors classify the face pose region. Li et al does utilize an

image that is oriented correctly (as explained above and shown by Silverbrook) in

order to determine angle-range information. Li does not teach away, and in fact,

teaches the limitations of the claim, as explained in the previous office action.

6.   Therefore, the previous rejections are maintained.

Claim Rejections - 35 USC § 112

7.   The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly
> claiming the subject matter which the applicant regards as his invention.

8.   Claims 3 and 7 are rejected under 35 U.S.C. 112, second paragraph, as

being indefinite for failing to particularly point out and distinctly claim the subject

matter which applicant regards as the invention.

9.   Regarding claims 3 and 7, both claims claim "an input image." The claims

that they depend on, claim 1 and claim 5 already claim an image input. It is

unclear if the input image of claims 3 and 7 correspond to the image input of

claims 1 and 5, or if the input image is another input image not corresponding to

the previous claim. Appropriate correction is required.

Claim Rejections - 35 USC § 103

10.   The following is a quotation of 35 U.S.C. 103(a) which forms the basis for

all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described
> as set forth in section 102 of this title, if the differences between the subject matter sought to
> be patented and the prior art are such that the subject matter as a whole would have been
> obvious at the time the invention was made to a person having ordinary skill in the art to which
> said subject matter pertains. Patentability shall not be negatived by the manner in which the
> invention was made.

11.   Claims 1, 2, 4/1, 4/2, 5, 6, 8/5, 8/6, 9/1, 9/2, 10/1, 10/2, 11/1 and 11/2 are

rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent

No.6597817 (Silverbrook) in view of U.S. Patent No. 7050607 (Li et al).

Regarding claim 1, Silverbrook discloses an image processing apparatus

comprising (fig. 2): image input means for inputting an image: an area image

sensor (col. 3, lines 33-34); image attached information input means for inputting

information attached to the image input by the image input means: the attached

information being the corresponding orientation angle and the means being the

orientation sensor (col. 3, lines 30-32); face detection means for detecting a face

from the image input by the image input means, an algorithm that detects a face

(col. 3, lines 46-52). Silverbrook basically states that after experiencing an image

input and sensing a basic orientation, and thus finding the right side up, face

detection algorithms can be used (col. 3, lines 46-52).

Silverbrook does not disclose expressly that the algorithms include face-detection angle-range information determination means for determining an angle range used in a process of detecting a face from the input image on the basis of the image attached information input by the image attached information input means; and process control means having a mode to control the execution of the face detecting process on the basis of information indicating the angle range determined by the face-detection angle-range information determination means.

Li et al discloses face detection angle-range information determination means, a detector pyramid (col. 6, lines 20-22) for determining an angle range used in a process of detecting a face from an input image (col. 6, lines 17-32) on the basis of the image attached information input, corresponding to Silverbrook's orientated, right-side up image, which also corresponds to Li et al using a right-side up image (fig 8), and even going to a another step of limiting the right-side up image in sub-windows (col. 6, lines 39-41). Li et al further discloses process control means (fig. 6, fig. 3), having a mode to control the execution of the face detecting process on the basis of information indicating the angle range determined by the face-detection angle-range information determination means (col. 6, lines 22-57), since the layered system has many layers or modes to control the face detection on the basis of the indicated angle range of the layer.

Silverbrook and Li et al are combinable because they are from the same field of endeavor, i.e. facial image processing.

At the time of the invention, it would have been obvious to a person of ordinary skill in the art to use an angle range to detect a face.

The suggestion/motivation for doing so would have been to provide a

more thorough, more accurate recognition by considering all possible angle

ranges a face could be in.

Therefore, it would have been obvious to combine the apparatus of

Silverbrook with the range of angles of Li et al to obtain the invention as specified

in claim 1.

12.   Regarding claim 2, Li et al discloses that the process control means

controls the execution of the face detecting process in predetermined angle

increments, the predetermined angle increments being those of the different

layers (col. 6, lines 25-32).

13.   Regarding claim 4/1, Li et al discloses reference data conversion means,

that which captures images for training data in fig. 3, step 302 and continues to

convert training data in step 304, for converting face detection reference data by

cropping and normalizing, used for face detection into reference data for a tilted

face, since the data is used to train a pyramid for the classifiers which is used in

the face detection (fig. 3, step 306), wherein the process control means allows

the reference data conversion means to convert the face detection reference

data into reference data for a tilted face in order to form tilted-face reference data

in predetermined angle increments, the angle increments being the

predetermined angle ranges shown in fig. 4, and the tilted-face reference data

being the data that is used to train the pyramid in fig. 3 step 306, and executes

the face detecting process to the input image using the formed tilted-face

reference data, since the reference data is used to train the pyramid (fig. 4).

14.   Claim 5 is rejected for the same reasons as claim 1. Thus, the arguments analogous to that presented above for claim 1 are equally applicable to claim 5. Claim 5 distinguishes from claim 1 only in that claim 5 is an image processing method, and claim 1 is an apparatus. Since an apparatus carries out a method, prior art applies.

15.   Claim 6 is rejected for the same reasons as claim 2. Thus, the arguments analogous to that presented above for claim 2 are equally applicable to claim 6. Claim 6 distinguishes from claim 2 only in that they have different dependencies, both of which have been previously rejected. Therefore, prior art applies.

16.   Claims 4/2, 8/5 and 8/6 are rejected for the same reasons as claim 4/1. Thus, the arguments analogous to that presented above for claim 4/1 are equally applicable to claims 4/2, 8/5 and 8/6. Claims 4/2, 8/5 and 8/6 distinguish from claim 4/1 only in that they have different dependencies, both of which have been previously rejected. Therefore, prior art applies.

17.   Claims 9/1, 9/2 10/5, 10/6, 11/5 and 11/6 are rejected for the same reasons as claim 1. Thus, the arguments analogous to that presented above for claim 1 are equally applicable to claims 9/1, 9/2 10/5, 10/6, 11/6 and 11/5. Claims 9/1, 9/2 10/5, 10/6, 11/6 and 11/5 distinguish from claim 1 only in that claims 9/1, 9/2 10/5, 10/6, 11/6 and 11/5 are program and storage medium claims and claim 1 is an apparatus claim and they have different dependencies. Since all the dependencies have been previously rejected, and since the preamble to the claim is not given any patentable weight because it doesn't

breath life or vitality into the claim, and since all other limitations are addressed in

claim 1, prior art applies.

18.   Claims 3/1, 3/2, 7/5 and 7/6 are rejected under 35 U.S.C. 103(a) as being

unpatentable over Silverbrook in view of Li et al, as applied to claims 1, 2, 5 and

6 above, and further in view of U.S. Patent Application Publication No

20010019620 (Nagai et al).

Regarding claim 3/1, Silverbrook (as modified by Li et al) discloses all of

the claimed elements as set forth above and incorporated herein by reference.

Silverbrook (as modified by Li et al) does not disclose expressly image

rotation means for rotating an input image, wherein the process control means

allows the image rotation means to rotate the input image in order to form images

in predetermined angle increments, and performs the face detecting process to

the respective images.

Nagai et al discloses image rotation means (fig. 4) for rotating an image,

since an image is rotated around an axis by taking more images at a different

rotation angle (fig. 4, item 108 and 109), wherein the process control means

allows the image rotation means to rotate the input image in order to form images

in predetermined angle increments, the angle increments being the

predetermined distance (page 4, paragraph 0059) around the subject and thus a

predetermined angle (fig. 2), and performs a face detecting process to the

respective images by detecting skin color ratio and thus the face detecting (fig. 4,

step 104). It is noted Nagai has a different way of detecting the face as Li et al

does, but they are both face detection processes and thus both applicable to each other.

Silverbrook (as modified by Li et al) and Nagai et al are combinable because they are from the same field of endeavor, i.e. face detection.

At the time of the invention, it would have been obvious to a person of ordinary skill in the art to form images around the input image.

The suggestion/motivation for doing so would have been to provide a more robust system, and a more widely applicable system by allowing the system to obtain an optimal image.

Therefore, it would have been obvious to combine the apparatus of Silverbrook (as modified by Li et al) with the multiple images of Nagai et al to obtain the invention as specified in claim 3/1.

19.   Claims 3/2, 7/5 and 7/6 are rejected for the same reasons as claim 3/1. Thus, the arguments analogous to that presented above for claim 3/1 are equally applicable to claims 3/2, 7/5 and 7/6. Claims 3/2, 7/5 and 7/6 distinguish from claim 3/1 only in that they have different dependencies, both of which have been previously rejected. Therefore, prior art applies.

Conclusion

20.   **THIS ACTION IS MADE FINAL.** Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is

filed within TWO MONTHS of the mailing date of this final action and the advisory

action is not mailed until after the end of the THREE-MONTH shortened statutory

period, then the shortened statutory period will expire on the date the advisory

action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be

calculated from the mailing date of the advisory action. In no event, however, will

the statutory period for reply expire later than SIX MONTHS from the mailing
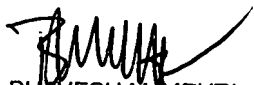
date of this final action.

Any inquiry concerning this communication or earlier communications from

the examiner should be directed to Kathleen S. Yuan whose telephone number is

(571)272-2902. The examiner can normally be reached on Monday to

Thursdays, 9 AM to 5 PM.

If attempts to reach the examiner by telephone are unsuccessful, the

examiner's supervisor, Bhavesh Mehta can be reached on (571)272-7453. The

fax phone number for the organization where this application or proceeding is

assigned is 571-273-8300.

Information regarding the status of an application may be obtained from

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KY
9/11/2007

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